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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,194	02/05/2004	Yi-Chiau Huang	AMAT/8461/CMP/ECP/RKK	6951

44257 7590 08/23/2005

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EXAMINER	
JEFFERSON, QUOVAUNDA	
ART UNIT	**PAPER NUMBER**
2823	

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/774,194	HUANG, YI-CHIAU	
	Examiner	Art Unit	
	Quovaunda Jefferson	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02/05/2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 6/8/04
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 8 is rejected under 35 U.S.C. 102(e) as being anticipated by Uzoh et. al, US Patent 6,692,588. Uzoh teaches a method of processing a substrate, comprising of plating a conductive layer onto a substrate (column 3, lines 39-41), rinsing the substrate of unwanted residue chemicals (column 1, lies 44-46), preheating the substrate during the rinsing process to a temperature of between about 50°C and about 100°C (column 4, lines 11-12), and annealing the substrate at an annealing station at a temperature of between about 150°C and about 450°C subsequent to the preheating process (column 4, lines 13-45).

Regarding claim 13, Uzoh teaches the method of claim 8, wherein preheating the substrate comprises applying radiant heat to the substrate during the rinsing (column 4, line 8).

Regarding claim 14, Uzoh teaches the method of claim 8, wherein the rinsing and preheating steps are conducted simultaneously (column 4, line 8).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheung et. al, US Patent Application 2002/0130046 and Uzoh.

Regarding claim 1, Cheung teaches a method for processing a substrate, comprising of plating a conductive layer onto a substrate (paragraph 25), transferring the substrate from a plating cell to a cleaning cell (paragraph 24 and 25) and transferring the substrate from the cleaning cell to an annealing station (paragraph 24 and 25). Uzoh teaches heating the substrate in the cleaning cell (column 2, lines 25-26) and annealing the substrate at the annealing station at a temperature of between about 150°C and about 450°C (column 3, lines 32-33). It would have been obvious to one skilled in the art to combine the teachings of Cheung and Uzoh to create a more

efficient and time saving method and apparatus for in-situ cleaning and annealing of a plated work piece (column 2, lines 3-4).

Regarding claim 2, Cheung and Uzoh teach the method of claim 1, wherein heating the substrate comprises applying a rinsing solution having a temperature of between about 50°C and about 100°C (Uzoh, column 4, lines 11-13).

Regarding claim 3, Cheung and Uzoh teach the method of claim 1, wherein heating the substrate comprises applying a rinsing solution having a temperature of between about 75°C and about 100°C and drying the substrate in the cleaning cell (Uzoh, column 4, lines 1-12).

Regarding claim 4, Cheung and Uzoh teach the method of claim 3, further comprising rotating the substrate at a rate of between about 10 rpm and 500 rpm (Uzoh, column 4, line 4).

Regarding claim 5, Cheung and Uzoh teach the method of claim 1, wherein heating the substrate comprises radiating the substrate while a rinsing fluid is dispensed thereon (Uzoh, column 4 line 5).

Regarding claim 6, Cheung and Uzoh teach the method of claim 1, wherein a timeframe between drying the substrate and annealing the substrate is between about 20 seconds and about 60 seconds (Cheung, paragraph 25).

Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable. Cheung and Uzoh teach the method of claim 1, but fail to teach wherein a duration of the drying is between about 5 seconds and about 25 seconds. However, given the teaching of the references, it would have been obvious to determine the optimum thickness, temperature as well as condition of delivery of the layers involved See *In re Aller, Lacey, and Hall* (10 USPQ 23 3-237) "It is not inventive to discover optimum or workable ranges by routine experimentation. Note that the specification contains no disclosure of ether the critical nature of the claimed ranges or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that tile chosen dimensions are critical. *In re Woodruff*, 919 f.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Any differences in the claimed invention and the prior art may be expected to result in some differences in properties. The issue is whether the properties differ to such an extent that the difference is really unexpected. *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)

Appellants have the burden of explaining the data in any declaration they proffer as evidence of non-obviousness. *Ex parte Ishizaka*, 24 USPQ2d 1621, 1624 (Bd. Pat. App. & Inter. 1992).

An Affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979).

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh as applied to claim 8 above, and further in view of Kimura, US Patent Application 2001/0024691.

Regarding claim 9, Uzoh teaches the method of claim 8, but does not teach the method wherein rinsing and preheating are conducted in a spin rinse dry cell. Kimura teaches the method wherein rinsing and preheating are conducted in a spin rinse dry cell (paragraph 10). It would have been obvious to one skilled in the art to use the teachings of Uzoh and Kimura to set up a dry-in dry-out configuration (Kimura, paragraph 10).

Regarding claim 10, Uzoh and Kimura teach the method of claim 9, wherein heating comprises dispensing a heated rinsing solution onto the substrate (Uzoh, column 4, lines 11-13).

Regarding claim 11, Uzoh and Kimura teach the method of claim 10, wherein the heated rising solution comprises deionized water at a temperature of between about 50°C and about 100°C (Uzoh, column 4, lines 11-13).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh and Kimura as applied to claim 9 above, and further in view of Cheung. Uzoh and Kimura teach the method of claim 9, further comprising transferring the substrate from the spin rinse dry cell to the annealing station when the preheating is finished, but do not teach the transferring process having a duration of between about 20 seconds and about 60 seconds. Cheung teaches the transferring process having a duration of between about 20 seconds and about 60 seconds (paragraph 25). It would have been obvious to one skilled in this art to combine the teachings of Cheung with Uzoh and Kimura because one advantage of such in-situ processing is that the time delay between the cleaning and annealing steps can be kept relatively short (paragraph 25).

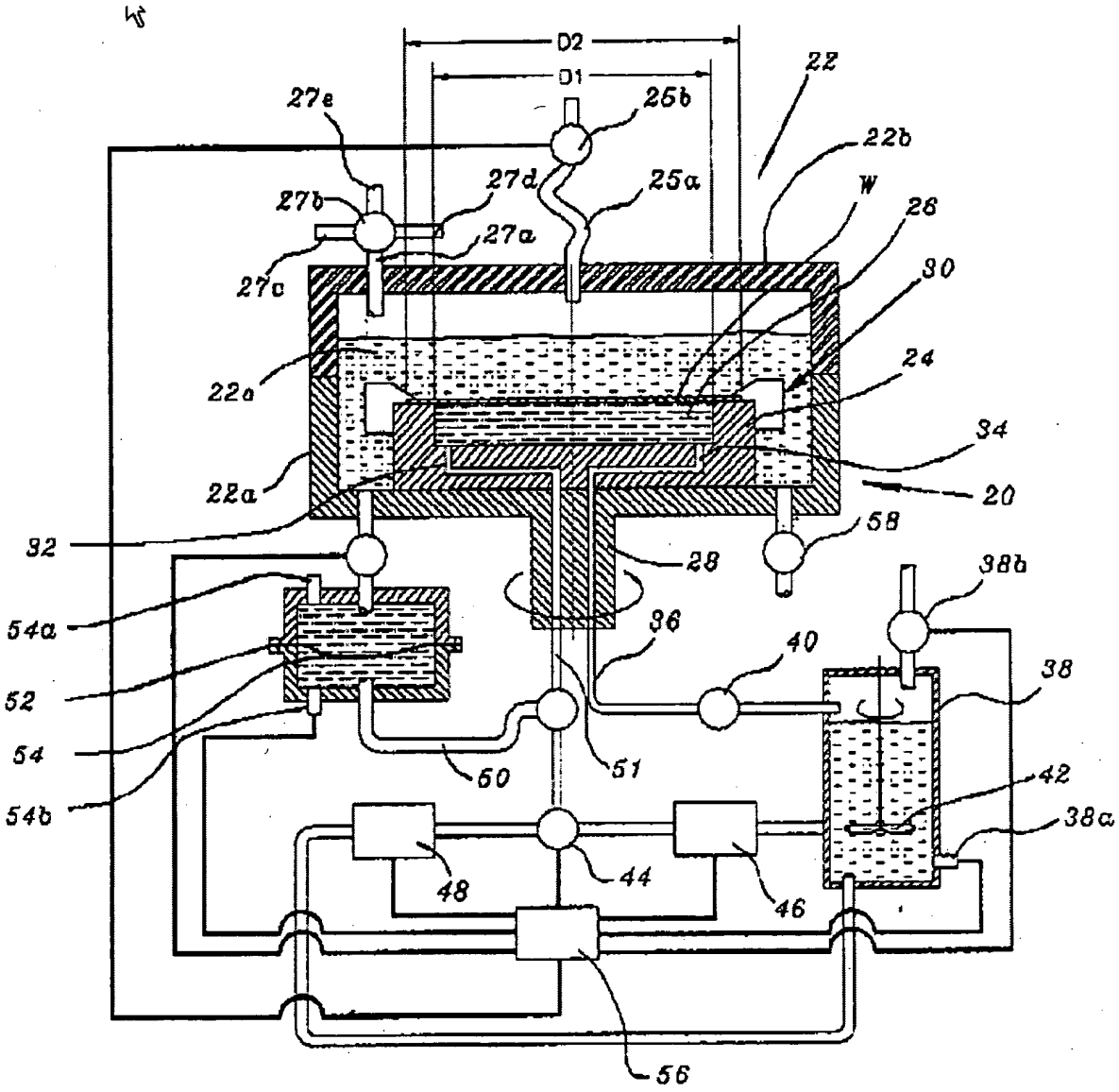


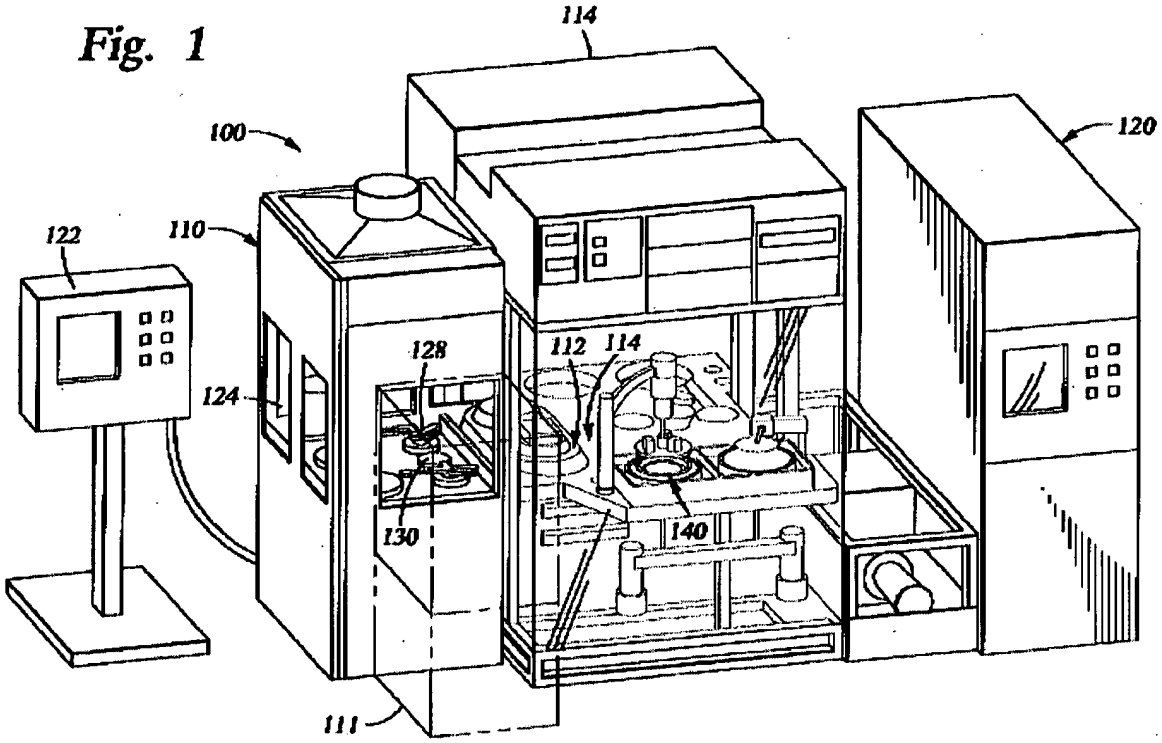
Fig. 1

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh as applied to claim 8 above, and further in view of Ivanov, US Patent Application 2004/0097071. Please see figure 1 above paragraph.

Regarding claim 15, Uzoh teach the method of claim 8, but doesn't teach further comprising controlling a temperature of a rinsing fluid to remain at a constant temperature. Ivanov teaches controlling a temperature of a rinsing fluid to remain at a constant temperature **46**. It would have been obvious to one skilled in the art to combine the teachings of Uzoh and Ivanov to control the temperatures of the processes (Ivanov, paragraph 83).

Regarding claim 16, Uzoh and Ivanov teaches the method of claim 15, further comprising reading a temperature of a heated solution with a thermocouple **38a** and controlling a heater positioned in communication with the rinsing solution in accordance with a temperature indicated by the thermocouple **38a**.

Fig. 1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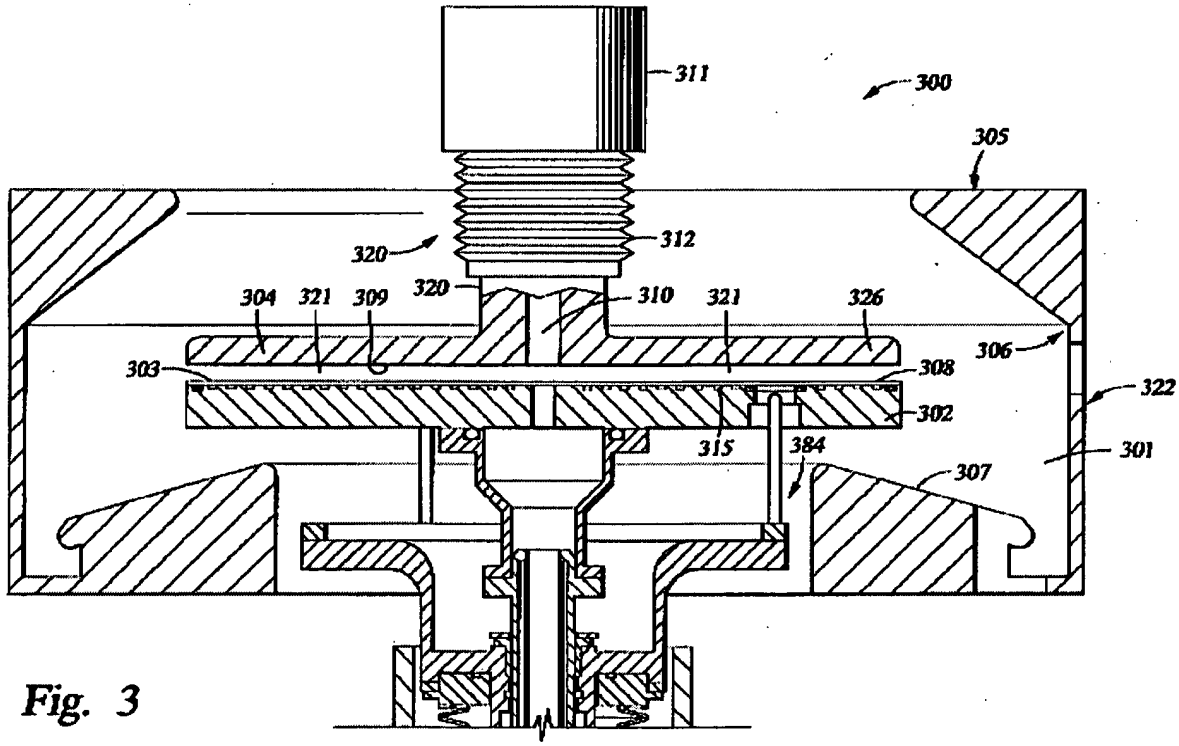
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Fig. 3

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lubomirsky, US Patent Application Publication 2003/0131494. See figures 1 and 3 directly above. Lubomirsky teaches an apparatus for processing a substrate, comprising of a plating cell positioned on a processing platform, the plating cell being configured to plate a conductive layer onto the substrate, **figure 1-100**, a rinsing cell positioned on the processing platform, the rinsing cell comprising: a substrate support member configured to support the substrate for processing, **figure 3-302**, a fluid dispensing nozzle positioned to dispense a rinsing solution onto the substrate, **figure 3-310**, and a fluid heating assembly positioned in fluid communication with the fluid dispensing nozzle (paragraph 27), the fluid heating assembly being configured to supply a heated rinsing solution and a substrate annealing station positioned in communication with the processing platform, **figure 1-111**.

Lubomirsky does fail to teach the fluid heating assembly being configured to supply a heated rinsing solution about 50°C and about 100°C. However, given the teaching of the references, it would have been obvious to determine the optimum thickness, temperature as well as condition of delivery of the layers involved See *In re Aller, Lacey, and Hall* (10 USPQ 23 3-237) "It is not inventive to discover optimum or workable ranges by routine experimentation. Note that the specification contains no disclosure of ether the critical nature of the claimed ranges or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen

dimensions or upon another variable recited in a claim, the Applicant must show that tile chosen dimensions are critical. *In re Woodruff*, 919 f.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Any differences in the claimed invention and the prior art may be expected to result in some differences in properties. The issue is whether the properties differ to such an extent that the difference is really unexpected. *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)

Appellants have the burden of explaining the data in any declaration they proffer as evidence of non-obviousness. *Ex parte Ishizaka*, 24 USPQ2d 1621, 1624 (Bd. Pat. App. & Inter. 1992).

An Affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979).

Regarding claim 18, Lubomirsky teaches the apparatus of claim 17, wherein the rinsing cell is configured to dispense the heated rinsing solution onto the substrate during a spin rinse dry process (paragraph 27-30).

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable. Lubomirsky teaches the apparatus of claim 18, but fails to teach further comprising a substrate transfer robot positioned on the processing platform, the substrate transfer robot being configured to transfer the substrate from the rinsing cell to the annealing station in less

than about 15 seconds. However, given the teaching of the references, it would have been obvious to determine the optimum thickness, temperature as well as condition of delivery of the layers involved See *In re Aller, Lacey, and Hall* (10 USPQ 23 3-237) "It is not inventive to discover optimum or workable ranges by routine experimentation. Note that the specification contains no disclosure of ether the critical nature of the claimed ranges or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that tile chosen dimensions are critical. *In re Woodruff*, 919 f.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Any differences in the claimed invention and the prior art may be expected to result in some differences in properties. The issue is whether the properties differ to such an extent that the difference is really unexpected. *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)

Appellants have the burden of explaining the data in any declaration they proffer as evidence of non-obviousness. *Ex parte Ishizaka*, 24 USPQ2d 1621, 1624 (Bd. Pat. App. & Inter. 1992).

An Affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979).

Regarding claim 20, Lubomirsky teaches the apparatus of claim 18, wherein the substrate heating assembly comprises a fluid tank having a controllable heating element

therein, the heating element being configured to maintain fluid in the tank at a predetermined temperature (paragraph 27).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quovaunda Jefferson whose telephone number is 571-272-5051. The examiner can normally be reached on Monday through Friday, 8AM to 4:30PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qvj

W. DAVID COLEMAN
PRIMARY EXAMINER